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MANUAL OF RECOMMENDED PRACTICE FOR SANITARY CONTROL OF THE SHELLFISH INDUSTRY

Public Health Service
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Manual of Recommended Practice for Sanitary Control of the Shellfish Industry

1946 Recommendations of the Public Health Service

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FEDERAL SECURITY AGENCY • Public Health Service

Manual of Recommended Practice

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FEDERAL SECURITY AGENCY • Public Health Service

Division of Sanitation of the Bureau of State Services

I

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INTRODUCTION

In 1925, State and local health authorities and the shellfish producers requested the Public Health Service to exercise supervision over the sanitary quality of shellfish shipped in interstate commerce. In conformance with this request, a system of endorsement of State control measures, was developed whereby each shellfish-producing State presents a list of certified dealers which it has determined conforms to State requirements. Such lists, if the State control measures are acceptable to the Public Health Service, are published periodically for the information of consumer States. To establish the degree of State control deemed essential, the Public Health Service prepared the "Minimum Requirements for Endorsement of State Shellfish Control Measures and Certifications for Shippers in Interstate Commerce."

As a development of these Minimum Requirements, the present manual has been prepared to enumerate more specifically the items of sanitation which should be observed. Certain inspection forms and rating sheets may be used to determine as precisely as possible the degree of compliance attained with Public Health Service requirements in each producing State.

GENERAL ADMINISTRATIVE PROCEDURE

In carrying out this cooperative control the State, the industry, and the Public Health Service are each responsible for certain procedures. These procedures are in general as follows:

The State shellfish regulatory authorities promulgate the requirements which must be met by the industry. The industry carries out the State requirements. The Public Health Service evaluates the extent of compliance with its own requirements and expresses its opinion regarding the adequacy of compliance upon which will be based its endorsement or withholding of endorsement of State control measures.

1. Procedures to be followed by the State.

(a) The State adopts adequate laws and regulations for the sanitary control of the shellfish industry.

(b) The State shellfish regulatory authority makes the necessary inspections, sanitary and bacteriological surveys of the growing areas, indicates areas from which shellfish may be marketed, the contaminated areas from which market shellfish may not be taken, and patrols its restricted areas.

(c) The State shellfish regulatory authority inspects each shellfish plant periodically. It is intended that the State be guided by this manual in the making of such inspections and in evaluating the results thereof.

(d) The State shellfish regulatory authority issues numbered certificates to producers and dealers handling shellfish entering interstate commerce after it has been determined that the shellfish conform to State requirements.

(e) The State shellfish regulatory authority makes all State records and information pertaining to its sanitary control of the shellfish industry available to the Public Health Service.

2. Procedures to be followed by the Industry.

(a) Holders of State certificates place the number of the certificate on each package of their shellfish shipped in interstate commerce.

(b) All interstate shippers of shellfish keep records of all interstate shipments in such detail as to facilitate quick tracing of any particular shipment to the point of origin. Such records are made available for inspection at reasonable hours by representatives of the State regulatory authority and of the Public Health Service.

3. Procedures to be followed by the Public Health Service.

(a) The Public Health Service inspects and rates a representative number of shucking and packing plants annually in each State, cooperates with the States in making sanitary and bacteriological surveys of growing areas, or makes such surveys independently by agreement with the State regulatory authorities. The entire State control procedure and machinery for sanitary control of shellfish are examined and rated annually by the Public Health Service.

(b) The Public Health Service publishes and keeps current a list of interstate shippers of shellfish certified by each shellfish-producing State for the information of health authorities and others concerned in shellfish-consuming States.

1. DEFINITIONS

The following definitions shall apply in the interpretation of this manual:

And/or.—Where this term is used, "and" shall apply where possible, otherwise "or" shall apply.

Area, growing.—Growing area is any area in which market shellfish or seed shellfish are growing. (Sec. 2, p. 4.)

Areas, approved.—Areas which, after examination as required in 2.3, p. 5 of this manual are approved.

Areas, grossly polluted, closed.—Areas from which the taking of shellfish for market purposes is not permitted. (Sec. 2.4, p. 6.)

Areas, moderately polluted, restricted.—Areas which are intermediate between approved and grossly polluted areas as regards exposure to and protection against fecal pollution.

Cleansing.—Cleansing is the artificial process of removing from shellfish such contamination as they have acquired while growing in moderately polluted growing areas. (Sec. 4.2, p. 14.)

Coliform organisms.—Wherever the term "coliform organisms," "coliform group," or "coliform bacteria" occurs, such term shall be considered to include all of the organisms which upon transfer from a positive presumptive test (as positive in lactose broth) show fermentation with gas formation in lactose medium containing 0.00133 percent brilliant green and 2.0 percent of bile (brilliant green lactose bile broth).

Conditioning.—Conditioning is that process which permits market shellfish to free themselves of retained sand, grit, and/or silt under controlled conditions. (Sec. 4.1, p. 14.)

Depletion.—Depletion is the complete removal of all growing shellfish from the area in question. (Sec. 2.9, p. 10.)

Floating.—Floating consists of holding market-size shellfish on structures of wood or other material supported by pontoons or piling in shallow bodies of water near shore. No rigid definition of what is near shore seems practicable.

Near shore.—Generally speaking, areas within a thousand feet of mean low water mark should be considered as being near shore. Cultivation of shellfish on trays supported on piling, near shore or in lagoons surrounded by dikes connected to the shore or in shallow areas near shore shall be considered as being in the same category, as far as risks to the public health are concerned, as the practice of floating, and shall be subjected to the same, or equally rigid, restrictions. (Sec. 4.3, p. 16.)

Re-laying.—Re-laying is that process which involves the removal of market shellfish from any of the three classes of growing areas to other growing areas to improve their quality of growth or both. (Sec. 2.7, p. 8.)

Repacking.—Repacking is the packing of shucked shellfish in plants other than those in which they have been shucked.

Shellfish.—Shellfish means all fresh and frozen oysters, clams, and mussels, either shucked or in the shell, and any fresh edible products thereof.

Shellfish, market.—Market shellfish are those shellfish which are harvested and/or prepared for sale to the consumer.

Shellfish, seed.—Seed shellfish are those shellfish which are harvested for use by the gatherer or for sale to a shellfish planter or grower to be laid down again in growing areas for further growth and cultivation.

Shellfish, shucked.—Shucked shellfish are those shellfish which have been removed from their shells.

Shell stock.—Shell stock are shellfish which remain in their shells.

Storage, dry.—Dry storage is the storage of market shell stock out of water. (Sec. 4.4, p. 17.)

Storage, wet.—Wet storage is the storage in water of shellfish intended to be marketed within three months, whether the storage be in natural bodies of water or in tanks containing sea water. (Sec. 4.3, p. 16.)

Transplanting.—Transplanting is the process which involves the removal of seed shellfish from one area to another area.

Water shallow.—Water less than five feet deep at low tide.

2. GROWING AREAS

2.1 Surveys.—All shellfish growing areas in any State shall have been examined by sanitary and bacteriological surveys, prior to the approval of interstate shipments of shellfish from such areas.

Public Health Reason: Shellfish grow in bodies of salt water receiving fresh water run-off. Frequently, the rivers or smaller streams entering shellfish growing areas carry contamination which may either have been washed into them from the land areas drained by such rivers, streams, or tributaries, or may have been conveyed into them through artificial structures such as drains, canals, or sewers. Many times they receive sewage originating in cities, towns, villages, or isolated houses. Unless careful surveys, supplemented by bacteriological examinations of the water are made to ascertain whether areas from which shellfish are shipped to market are at times exposed to serious contamination of human origin, such shellfish may become a medium through which disease may be conveyed. Periodic bacteriological examination of samples of water does not take the place of sanitary surveys but is an integral part of such surveys.

Satisfactory Compliance: This item shall be deemed to have been satisfied if: A thorough examination of the watershed tributary to the shellfish growing area has been made by technically trained persons competent to evaluate the probable effect upon the shellfish growing area of the discharge of sewage into tributary streams taking into account the following factors:

(1) The quantity of pollution from all sources, including sewage of domestic origin.

(2) The degree of treatment (if any) given the sewage before being discharged, particularly as concerns the probable destruction of pathogenic organisms.

(3) The degree of dilution of the sewage with clean water.

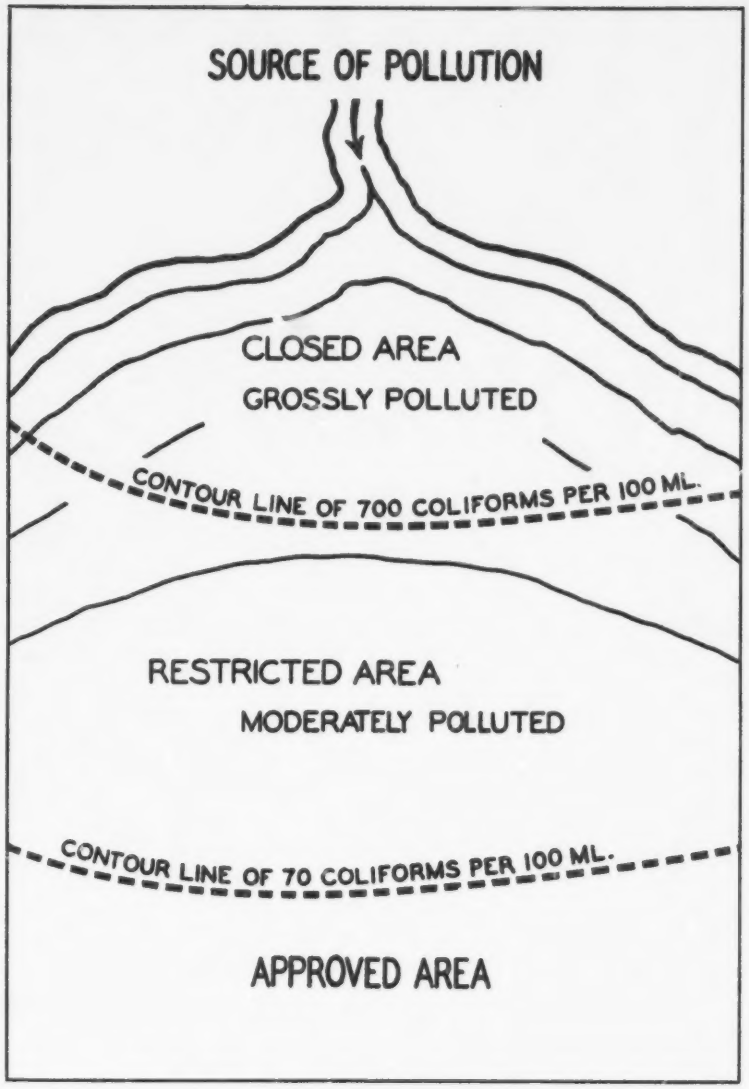

FIGURE 1—*Sketch showing classification of shellfish growing areas*

(4) The relative freshness of sewage discharges as determined by the lapse of time between such discharges and their arrival in the shellfish area.

(5) The opportunities afforded for natural self-purification of the area.

(6) The bacteriological examinations of water samples collected from predetermined stations in the area on different days sufficient to give a bacteriological picture of the water under various stages of tide and under varying weather conditions.[1]

2.2 Classification of Shellfish Areas.—All shellfish growing areas in any State shall be classified as approved or restricted. Restricted areas may be further subdivided and designated as either moderately polluted or grossly polluted. In order to confirm or modify tentative classifications based on the sanitary survey, moderately polluted shellfish growing areas should be examined rather intensively for the presence and density of coliform organisms, particularly in those portions of the areas bordering on the approved areas. Only occasional bacteriological samples are necessary from areas which the sanitary survey indicates are obviously free from pollution or are grossly polluted.

Public Health Reason: The probable presence or absence of pathogenic organisms in shellfish waters and therefore the probable contamination of shellfish contained in such waters is of the greatest importance in deciding whether or not shellfish obtained from such areas may be marketed directly without submitting them to further treatment or whether the shellfish obtained from such areas should be subjected to purification or cleansing processes before granting permission to market them. There is no practicable process on which to base judgment regarding the probable freedom of such areas from the presence of pathogenic organisms other than by making a careful inventory of all the actual and potential sources of pollution which might affect the area, carefully weighing the probability that natural purification will protect shellfish areas and testing any conclusions thus reached by a series of bacteriological examinations of samples of water to determine the most probable number of coliform bacteria present (organisms associated with sewage pollution).

2.3 Approved Shellfish Areas.—Approved shellfish areas shall satisfy the following conditions:

The sanitary survey shall disclose no likelihood that human fecal dis-

[1] In making the bacteriological survey the number of samples examined from each station should be sufficient to give a true picture of the number of coliform organisims present in the water under the various tides and weather conditions occurring during the shellfish harvesting period.

The minimum number will vary with the various areas and the purpose for which the examinations are made. Where examinations are made to define the line between approved and restricted areas it is believed that a record of at least 15 samples per station in the critical area is necessary.

charges reach the area in dangerous concentrations or before sufficient time has elapsed to render such discharges innocuous.

The median bacteriological content of samples of water collected from those portions of the area determined by sanitary survey to be most probably exposed to fecal contamination shall not show the presence of organisms of the coliform group in excess of 70 per 100 ml. of water expressed in terms of most probable numbers (MPN) in a series of samples from each station sufficient to determine the conditions existing. These samples shall have been collected throughout the suspected area during one or more active shellfish seasons during which conditions as disclosed by the sanitary survey shall have remained practically unchanged. The samples shall have been collected under various stages of tide and with due consideration to varying weather conditions.

Bacteriological re-examinations of the area must be made whenever periodical sanitary surveys, made not less than once every 2 years, indicate that there may have been a significant increase in the quantity of sewage entering the area since the last bacteriological examinations were made.

Permanent sampling stations shall be located on a chart of the area showing principal hydrographic and topographic data. (Charts of the U. S. Coast and Geodetic Survey should be used whenever they are available for the area under consideration.)

The spacing of the sampling stations shall take into consideration the location of shellfish areas, the depth of water at low tide, and the proximity of probable sources of pollution. A larger number of samples shall be taken in that portion of the area bordering on the moderately polluted area than in that portion of the area bordering on areas free from pollution. In order to establish a line between an approved area and a moderately polluted area, sampling points should ordinarily be spaced no further apart than approximately 1,000 feet in any direction.

In such bacteriological surveys a proportional number of samples should be collected under various tidal conditions, and with heavy rainfall and dry weather run-offs, to obtain an adequate picture of the possible pollution of the area.

2.4 Grossly Polluted Closed Areas.—If the sanitary survey discloses that the area is either obviously subject to gross pollution by direct discharge of sewage and other wastes, or demonstrably exposed more or less continuously to even slight direct contamination with human fecal discharges from nearby sources ashore, or if an area usually of good quality, is exposed to occasional direct and immediate contamination with human fecal discharges, or if bacteriological examinations indicate that the degree of contamination is greater than that tolerated for moderately polluted

areas, then such area may be declared to be a grossly polluted area from which the taking of shellfish for market purposes shall not be permitted.

2.5 Moderately Polluted Restricted Areas.—After making sanitary and bacteriological surveys as described in Sec. 2.1, p. 4, the area may be declared to be a moderately polluted restricted area if it is shown that:

(1) The area is intermediate between approved and grossly polluted areas as regards exposure to and protection against fecal pollution.

(2) The bacteriological survey discloses that the median bacteriological content of the water expressed in terms of the most probable number (MPN) of coliform organisms per 100 ml. lies between 70 and 700.

(3) The sanitary survey shows that such contamination is probably of human origin.

When an area has been classified as a moderately polluted restricted area bacteriological re-examination of the water in that portion of the area adjacent to the grossly polluted area shall be made at least every year if a partial sanitary resurvey indicates that an increase in contamination may have taken place. Partial sanitary resurveys consisting at least of a review of maps, office records, or data regarding significant changes in population, sewerage systems, sewage treatment facilities, or of other factors which might tend to cause an increase in the pollution of the area shall be made at least yearly. Complete sanitary surveys shall be made whenever the State regulatory authority issuing interstate shippers certificates deems such survey to be necessary. Information obtained from such surveys shall be made available to the Surgeon General of the United States Public Health Service whenever data on a particular area are desired. (A decision as to whether any given areas in this class may be used for the taking of shellfish, and if so, under what conditions should be based, in each instance, upon a careful and thorough study of the area which would take into account all factors which might affect the decision, namely; the findings on sanitary survey and on bacteriological examinations of the water. Sec. 2.1, p. 4.)

2.6 Hibernation (Oysters). —Under written permission from and under strict control by the State regulatory authority subject to the following restrictions, oysters may be taken for market purposes from moderately polluted areas during the period that the oyster is in hibernation.

The taking of oysters will be permitted only during the period when the temperature of the water remains consistently at or below 41° F. and permission will not be given by the State regulatory authority until it has determined that the coliform content of the oysters does not exceed 20 per 100 ml. expressed as MPN.

Public Health Reason: It is recognized that the oyster enters a state of hibernation during periods when the temperature of the water over-

lying the growing area is 41° F. or less and that while in that state is relatively free of bacteria of the coliform group.

Satisfactory Compliance: This item shall be deemed to have been satisfied if:

(1) Written permission to take oysters from a specified area is issued by the State regulatory authority.

(2) The taking of oysters from the area be limited to the period when the overlying water remains consistently at or below 41° F.

(3) No oysters are taken for market purposes until bacteriological examination shows a coliform content of 20 or less per 100 ml. expressed as MPN.

(4) The State regulatory authority maintains a strict control over the operations.

2.7 Re-laying.—Shellfish may be re-laid from one approved growing area to another approved area at any time. Shellfish may be re-laid from a polluted area to an approved area only under such restrictions as will not permit polluted shellfish to reach the consumer.

Public Health Reason: Shellfish from approved growing areas should not jeopardize the public health if they find their way to the market during the re-laying process. On the other hand, those from polluted areas may cause illness and death if they are sold after removal from the polluted grounds and before having been re-laid in approved areas for self-cleansing purposes. They must be held in approved areas for a sufficient length of time at a water temperature above 50° F. to accomplish self-cleansing. Below this temperature self-cleansing proceeds too slowly to make it effective. To eliminate the health hazard involved in re-laying, it is necessary to regulate the movement of shellfish from polluted to clean areas by means of suitable restrictions.

Satisfactory Compliance: This item shall be deemed to have been satisfied if:

(1) Written permission is given by the State agency having jurisdiction to the person desiring to take shellfish from a polluted area, and if notification of such permission is given to all other interested State agencies.

(2) Such permission is given only to responsible persons, said responsibility having been determined by the past record of the permit receiver.

(3) Taking of shellfish from polluted areas and laying them in approved areas is under the close supervision of the State agency having jurisdiction over shellfish sanitation.

(4) Shellfish taken from polluted areas and re-laid in approved areas are held in the approved areas for a period of at least 14 consecutive days, during which period the temperature of the water is constantly above 50° F.

(5) Shellfish re-laid during the marketing season in approved areas from polluted areas are not taken from the approved areas for market purposes until permission to do so has been received in writing from the State agency having authority over shellfish sanitation.

2.8 Policing of Closed Areas.—All shellfish areas which have been closed as the result of unsatisfactory findings following sanitary or bacteriological surveys shall be posted, warning the public that the shellfish are unsafe for human consumption and shall not be removed except for re-laying or transplanting. Notice shall also state the penalty to be imposed on those convicted of removing shellfish illegally from these areas. Closed areas shall be patrolled by the agency of the State government possessing authority at frequent intervals to make certain that no shellfish are removed illegally. This section shall apply both to areas used for the production of seed as well as to areas used for the production of market shellfish.

Public Health Reason: Because every effort made by the shellfish authorities to see that shellfish are produced and marketed under proper sanitary conditions may be defeated unless shellfish from closed areas are excluded from market, it becomes important that necessary steps to exclude unsafe shellfish be taken. This may be accomplished by adequately advertising and/or posting and policing closed areas, and by the rigid enforcement of appropriate laws. There is no sharp line of demarcation between large-sized seed shellfish and small-sized market shellfish, hence it is necessary to control operations pertaining to both classes of shellfish by means of certain safeguards.

Satisfactory Compliance: This item shall be deemed to have been satisfied if shellfish are not taken from closed areas illegally.

In the absence of direct evidence that shellfish have been taken illegally om closed areas, the following items may be used as criteria in judging the effectiveness of measures taken:

(1) If the boundaries of closed areas containing shellfish are conspicuously marked by fixed objects (preferably located ashore) which are easily visible from any point inside the closed area.

(2) If pri ed copies of the description of closed areas are supplied to persons licensed to take shellfish in the vicinity of such closed areas or if such copies are furnished without charge to any bona fide shellfish digger, tonger, dredge operator, or other interested persons requesting such description.

(3) If the closed areas are under periodic and effective patrol by the State department having jurisdiction, due consideration being given to surprise visits made at night.

(4) If record data showing designated closed areas and their relation-

ship to patrol activities and violations discovered are maintained in the central office of the State supervisory agency.

2.9 Depletion of Closed Areas.—In some cases it may be more economical to deplete a closed shellfish area than to attempt patrol. When this is undertaken all shellfish of market size and as many of smaller size as can be gathered by reasonable methods shall be removed from the areas under direct supervision of the State regulatory authority. A similar depletion of the area shall be carried out at approximately 2-year intervals.

Public Health Reason: Complete removal of shellfish from polluted areas to clean areas, under appropriate precautions, is the best safeguard against unsafe shellfish reaching the market and producing illness in consumers.

Satisfactory Compliance: This item shall be deemed to have been satisfied if:

(1) In the absence of effective patrolling the removal of shellfish from closed areas is effected within 2 years of the date of adoption of this manual; marketable shellfish are removed from the closed areas every 2 years thereafter, and

(2) The removal operations are carried out by a State agency or under the direct supervision of a State agency.

3. HARVESTING AND HANDLING

3.1 Boats.—All boats used for tonging, dredging, or transporting shellfish (including "buy" boats), shall be so constructed, operated, and maintained as to prevent contamination of the shellfish in the boat.

Public Health Reason: Precautions exercised in gathering shellfish from approved growing areas may be nullified by contamination from bilge water in the boat, by leakage or washing of contaminated water into the boat or over the sides when the boat is in areas subject to contamination.

Satisfactory Compliance: This item shall be deemed to have been satisfied if:

(1) Perforated platforms or storage bins are so constructed and located as to prevent bilge water or overboard polluted water from coming into contact with the shellfish.

(2) All water used for boat cleansing comes from unpolluted sources.

3.2 Disposal of Body Excretions.—During the marketing season no body excretions shall be discharged overboard from a boat used in harvesting shellfish while it is in areas from which shellfish are being dredged, tonged, or otherwise gathered. Such boats shall be provided with a watertight metal container, having a close-fitting metal cover, for reception of body excretions. The container shall be securely fastened to prevent spill-

ing. The contents of the container shall be disposed of by discharging into suitable sewage disposal units on shore or by discharging overboard in areas designated for this purpose by the State health authorities, or by burying, or by burning, after which the container shall be thoroughly cleaned before being returned to the boat.

Public Health Reason: Since gastrointestinal infections are at times conveyed by raw shellfish, it is highly important to protect the shellfish on boats and in shellfish growing areas, as well as areas adjacent thereto, from infection with such organisms as are known to be conveyed through excretions of the human body.

Satisfactory Compliance: This item shall be deemed to have been satisfied if:

(1) A boat which is away from shore toilet facilities more than 3 hours has thereon a watertight container made of heavy-gage metal, with a tight-fitting cover, of sufficient capacity to provide for the crew but in no case less than 2-gallon capacity.

(2) The container is securely fastened to the boat to avoid spilling and in such a position as to be at the maximum distance from shellfish on board.

(3) There is evidence that the container is used for the purpose provided for.

(4) The contents of the container are properly disposed of by discharging overboard into a designated area or carried to shore for disposal into a sewerage system or a sanitary privy, or are buried or incinerated.

(5) The container is thoroughly cleansed after the contents have been removed and before the container is returned to the boat.

3.3 Procedure to be Employed in the Bacteriological Examination of Shellfish and Shellfish Waters.—The procedures to be followed are those given in the Report of the American Public Health Association Standard Methods Committee to the Committee on Research and Standards, Journal of the American Public Health Association, vol. 33, No. 5, May 1943, pp. 582-91. The report is entitled "Recommended Method of Procedure for Bacteriological Examination of Shellfish and Shellfish Waters." (Copies are available from the American Public Health Association, 1790 Broadway, New York, N. Y., for 25 cents per copy.)

These procedures include those for bacteriological examination of shellfish growing waters and for bacteriological examination of shellfish. The interpretation and application of results of the bacteriological examination of shellfish growing waters have been set forth in 2.3, 2.4, 2.5, pp. 5, 6, 7 of this manual.

Until more data are available, any attempt to interpret the results of bacteriological examinations of shellfish other than oysters as taken from growing areas or cleansing processes in terms of their probable freedom

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from pathogenic organisms is questionable. For the time being, the chief reliance should be placed on the quality of the water over the growing areas or that used in cleansing processes. It seems reasonable to assume, however, that an MPN value of 2,400 or more coliform organisms per 100 ml. occurring in successive samples of shellfish, other than oysters, as taken from the growing area, at point of shucking or after cleansing should be interpreted as an indication of unfavorable conditions or practices surrounding the production and handling of the product and should necessitate investigation and further control activities on the part of the regulatory agency.

The following applies to the interpretation and application of results obtained from the bacteriological examination of oysters only:

When an MPN value of 230 or more of coliform organisms per 100 ml. of sample persists in oyster shell stock sampled at the growing areas or in shell stock or shucked oysters at the point of shucking, it should be interpreted as an indication of unfavorable conditions or practices surrounding the production and handling of the product and should necessitate investigation and improved control measures on the part of the supervisory agency, providing that in occasional samples, an MPN value of 2,400 coliform organisms per 100 ml. may be tolerated in some samples. If this occurs in more than 2 consecutive samples, corrective measures shall be enforced by the regulatory authority.

3.4 Comparison of Coliform Organism Scores with Most Probable Number of Coliform Organisms Per 100 Milliliter.—

Score	MPN	Score	MPN
1	20	41	1,300
2	45	50	2,400
3	78	140	3,500
4	130	230	5,400
5	230	320	9,200
14	330	410	16,000
23	490	500	24,000
32	790	1,400	35,000

3.5 Examination of Mussels and Clams for Presence of Poison.—A representative number of samples of mussels and clams shall be collected from growing areas suspected of containing poisonous shellfish and shall be examined for the presence of poison before mussels and clams intended for human consumption are taken from such growing areas.

Public Health Reason: Numerous cases of mussel poisoning and some deaths have occurred, especially on the Pacific Coast, from eating poisoned mussels. Research has indicated that the poison may be present in both

mussels and clams and has been associated with the presence of the dinoflagellate gonyaulax catenella in the water in which the shellfish grow. A method has been devised for detecting and quantitatively estimating the poison in shellfish but no specific treatment has been found for the poisoning.

Satisfactory Compliance: This item shall be deemed to have been satisfied if:

Representative samples of shellfish from growing areas are collected and examined for the presence of toxic substances whenever their occurrence is suspected or deemed possible. The need for making this test can be judged after experience by the presence in the overlying water of the dinoflagellates associated with mussel poisoning by the season of the year, and by other considerations such as reported poisonings among consumers or handlers of shellfish.

4. PREPARING FOR MARKET—PROCESSING

4.1 Conditioning.—Conditioning of shellfish from approved growing areas as defined in Sec. 2.3, p. 5, shall be permitted only in watertight tanks, adequately protected against introduction of contamination from adjacent or connected spaces or surfaces. The water used shall have a salinity equal to that of the water from which the shellfish are taken and shall, after treatment, meet the bacteriological requirements of the Public Health Service Drinking Water Standards. (This pamphlet, Public Health Reprint No. 2697 can be obtained from the Superintendent of Documents, Washington, D. C., price 10 cents).

Public Health Reason: Conditioning in natural bodies of water subject to all noncontrollable influences surrounding such natural conditions has been found to introduce so many possibilities of contamination as to jeopardize the quality of the shellfish undergoing conditioning processes. Numerous instances in which the conditioning of shellfish in natural bodies of water has been responsible for the spreading of illness are on record. Therefore, if conditioning is practiced, it shall be done in watertight tanks where the quality of the water can be rigidly controlled. (For details of methods which have been successfully applied in conditioning and cleansing of shellfish in England and America, reference is made to "Report on Mussel Purification," by R. W. Dodgson, in the Ministry of Agriculture and Fisheries, Fishery Investigations, Series II, vol. X, No. 1. London, and the "Report of the Shellfish Committee," American Public Health Association Year Book, 1936-37, pp. 180-196.

Satisfactory Compliance: This item shall be deemed to have been satisfied if:

(1) The tank is watertight and has relatively smooth inside surfaces to permit adequate cleansing; so located that the bottom of the tank is at

least 1 foot above the extreme high water mark of the water body adjacent to it, and the tops of the sidewalls are at least 4 inches above the level of the contiguous floor or ground surface.

(2) Floor or ground surfaces adjacent to the tank slope away from it to permit effective and complete drainage.

(3) Water for the process is obtained from a natural body of water, the quality of which, when treated, is equal to or better than that specified for growing areas.

(4) Applied water is maintained in such condition by the continuous or intermittent application of chlorine to it that the chlorine residual does not fall below 0.05 p.p.m.

(5) Water used for conditioning on entering the tank is:

free from objectionable settleable solids;

of a salinity at least equal to that to which the shellfish are accustomed, such salinity to be determined by the use of a hydrometer;

of a bacteriological quality at least equal to that for drinking water;

carrying a chlorine residual of not less than 0.5 p.p.m. as determined by the orthotolidine test 15 minutes after the chlorine application, or determined by some equivalent test.

(6) The fill-and-draw tank is emptied at least once every 24 hours or if a continuous-flow tank receives applied water at a rate that will fill it in not more than 24 hours.

(7) The oxygen content of the cleansing water at all points in the tank is maintained at not less than 30-percent saturation.

(8) The plant operator is experienced in this type of work or possesses a satisfactory knowledge of the principles of water treatment and bacteriology and satisfies the State health department that he is fully capable of operating the plant concerned.

(9) Plant employees possess at least the physical qualifications outlined for a shucker in Sec. 4.14, p. 22.

(10) Unauthorized persons as well as animals are excluded from the plant.

(11) Boots to be worn by an employee while working in a conditioning tank are used for this purpose only and are washed in chlorinated water containing at least 50 p.p.m. chlorine before the employee enters the tank.

(12) Suitable operating reports are submitted at least monthly to the controlling State agency.

4.2 Cleansing: Shellfish for artificial cleansing shall be taken only from clean or moderately polluted growing areas as defined in Sec. 2.5, p. 7. Artificial cleansing shall be permitted only in watertight tanks ade-

quately protected against the introduction of contamination from adjacent or connected spaces or surfaces. The water used shall have a salinity equal to that of the water from which the shellfish are taken and shall meet the requirements of the Public Health Service Drinking Water Standards. Adequate precautions shall be taken to prevent shellfish intended for cleansing from reaching the market before cleansing has been completed.

Public Health Reason: Artificial purification of moderately polluted shellfish has been proven to be successful if adequately and thoroughly performed. (See reference, bottom p. 6.) Experience has shown that some shellfish from polluted areas, due to inadequate policing, may reach the market. The cleansing process provides a safe outlet for some shellfish from moderately polluted growing areas and thereby reduces the volume of unsafe shellfish surreptitiously gathered and offered for sale through circuitous channels.

Satisfactory Compliance: This item shall be deemed to have been satisfied if:

(1) The tank is watertight and has smooth inside surfaces to permit adequate cleansing; so located that the bottom of the tank is at least 1 foot above the extreme high water mark of the water body adjacent to them, and the tops of the sidewalls at least 4 inches above the level of the contiguous floor or ground surface.

(2) Floor or ground surfaces adjacent to the tank slope away from it to permit effective and complete drainage.

(3) Water for the process is obtained from a natural body of water, the quality of which is equal to or better than that specified for approved growing areas and after treatment meets the same requirements as specified for the water used in conditioning. (Sec. 4.1, p. 14.)

(4) Applied water is maintained in such condition by the continuous or intermittent application of chlorine to it that the chlorine residual does not fall below 0.05 p.p.m.

(5) The oxygen content of the cleansing water at all points in the tank is maintained at not less than 30 percent saturation.

(6) Only live clean-washed shellfish, having a coliform content of less than 24,000 per 100 ml. expressed as MPN, and the shells of which are sufficiently whole to permit their retention of shell liquor are submitted to the process, and adequate precautions are taken to prevent shellfish intended for cleansing from reaching the market before cleansing is completed.

(7) Shellfish are treated for a period of not less than 24 hours in water having a temperature above 50° F.

(8) The results of tests for each batch of oysters cleansed give MPN coliform concentrations of not more than 230 per 100 ml. and for each

batch of soft clams cleansed an MPN coliform concentration of less than 2,400 per 100 ml. when subjected to a 24-hour presumptive test described in Sec. 3.3, p. 11.

(9) No treated shellfish are released for consumption without authority of a plant operator approved or licensed by the State regulatory authority.

(10) The plant operator is experienced in this type of work, or possesses a satisfactory knowledge of the principles of water treatment and bacteriology, and has been approved by the State health authorities.

(11) Unauthorized persons, animals, and rodents are excluded from the plant.

(12) Plant employees possess at least the physical qualifications outlined for a shucker in Sec. 4.14, p. 22.

4.3 Floating and Wet Storage.—Floating and wet storage as defined in Definitions, pp. 3 and 4, shall not be practiced unless written approval is given each year by the State regulatory authority. This approval is to include, whenever floating is involved, a sketch drawn to scale, showing on the reverse side of the interstate shipper's certificate issued to the interstate shipper, the fixed location of the float or structures and all the potential hazards to which shellfish floated in the designated area may be exposed. The statement shall also describe the measures taken to protect the shellfish from the above potential hazards. Similar sketches and descriptions shall be appended to certificates of shippers marketing shellfish cultivated near shor . The presence of usable floats in the water shall be deemed to be evidence that floating is being practiced.

Public Health Reason: Removal of shellfish from growing beds to artificial floats usually anchored close to shore and habitations and frequently in shallow water for convenience, subjects an accumulated quantity of shellfish usually deposited in an abnormal number of layers, to concentrations of pollution which may constantly or intermittently reach the floats and to which the shellfish are not subjected in growing areas as described in Sec. 2.1, p. 4. Shellfish on floats anchored over approved growing areas are more directly exposed to chance contamination from boats than are shellfish stored in the growing areas themselves, since it is customary to "float" the shellfish near the surface where fresh sewage is apt to be found in greatest concentration. Shellfish on floats are therefore protected to a less degree by dilution than are shellfish on bottom areas. Experience has demonstrated that floats are seldom permanently moored or secured over clean natural growing areas, but may be moved sooner or later to protected coves, harbors, or shallow areas to prevent their destruction in stormy weather or to docks and piers for easier access.

Satisfactory Compliance: This item shall be deemed to have been satisfied if:

(1) Floating is practiced only in strict compliance with the terms of the written approval of the State regulatory authority. This approval is to include a sketch drawn to scale on the reverse side of the certificate issued to the interstate shipper, showing the fixed location of the float or structures, the potential hazards to which shellfish floated in the designated area may be exposed, and a statement describing the measures taken to protect the shellfish from the above potential hazards. This written approval shall be valid for not longer than 12 months.

(2) Similar sketches and descriptions, as provided in the paragraph above shall be appended to Interstate Shippers Certificates marketing shellfish cultivated near shore.

4.4 Dry Storage.—Shell stock in dry storage shall be adequately protected from contamination at all times.

Public Health Reason: If shell stock is stored in a place where ground or surface water or drainage from floors, bilges, and equipment can accumulate, contamination carried by such water or drainage may contaminate the shell stock. Shellfish may be contaminated also by domestic animals and rodents if they are not excluded.

Satisfactory Compliance: This item shall be deemed to have been satisfied if:

(1) Floor of storage room is constructed of an impervious material free from cracks, holes, ruts, or other uneven surfaces that interfere with proper cleaning or drainage, and is graded to assure complete and rapid drainage.

(2) Storage area is protected from flooding.

(3) Walls are smooth and of material which will not deteriorate under repeated washings.

(4) Storage area contains no material or equipment not pertaining to storage of shellfish.

(5) Bins, hoppers, sacks, barrels, or other containers fully protect the stored shellfish from contamination.

(6) There is found no evidence of animals, rodents, and unauthorized persons having access to the plant.

Shucking and Packing Plant

4.5 Plant Arrangement.—Unless shellfish are shucked directly into packing containers with no further processing, the shucking and packing processes shall be done in separate rooms. There shall be installed in the partition between the two rooms a delivery window, through which the shucked stock is passed to the packing room.

Provision should be made for storing the employees outer garments, aprons, gloves, etc., in a separate room or rooms, or in lockers.

Public Health Reason: The nature of the shucking operation is such that the shuckers' clothing becomes very soiled. If shuckers enter the packing room, shucked stock, cans, and other equipment may become contaminated. Rooms or lockers are provided for clothing, aprons, and gloves to eliminate the tendency to store such articles on the shucking benches or in packing rooms, which interferes with the shucking and packing operations and the cleaning activities.

Satisfactory Compliance: This item shall be deemed to have been satisfied if:

(1) Shucking and packing operations are carried on in separate rooms unless shellfish are shucked directly into packing cans with no further processing.

(2) Shuckers do not go into or through the packing room for any purpose.

(3) The delivery window is provided with a suitable slide or door and the shelf is of smooth metal, concrete, or tile, draining toward the shucking room and curbed on the packing room side if necessary.

(4) Well-maintained rooms or lockers are provided for storing clothing, aprons, and gloves of employees.

4.6 Floors.—The floors shall be constructed of concrete or other impervious material; graded to drain quickly; free from cracks or uneven surfaces that interfere with proper cleaning or drainage; and maintained in good condition.

Public Health Reason: Properly graded floors of durable, impervious material such as concrete, maintained in good condition, promote rapid disposal of liquid and solid wastes, are easily cleansed and the floor is more apt to be kept in a clean and sanitary condition.

Satisfactory Compliance: This item shall be deemed to have been satisfied if the floor is:

(1) Of impervious material.

(2) Graded so that the drainage is complete and rapid.

(3) Free from holes, cracks, ruts, or other uneven surface.

4.7 Walls and Ceiling.—The walls shall be smooth, washable, and light colored. The ceiling, if provided, and the roof shall be tight to prevent entrance of dirt or other foreign material.

Public Health Reason: Light-colored and properly finished walls and ceiling encourage cleanliness and are more easily cleaned. A tight ceiling and roof reduce the possibility of dirt or other foreign material reaching the product, especially during inclement weather.

Satisfactory Compliance: This item shall be deemed to have been satisfied if:

(1) The walls are of smooth concrete or impervious material, or smooth painted wood which will not deteriorate under washing and flushing and are maintained in good condition.

(2) The ceiling, if provided, and roof are tight.

4.8 Screening.—During seasons when insects, especially house flies, are on the wing, space used for washing and packing shucked shellfish shall have all openings effectively screened, including outward-opening, self-closing doors, unless other effective means are provided to prevent the entrance of flies.

Public Health Reason: The habits and characteristics of flies are such that they may become an important factor in the spread of intestinal disease if flies are allowed to come in contact with shucked shellfish.

Satisfactory Compliance: This item shall be deemed to have been satisfied if:

(1) All openings are effectively covered with screening approved by the state regulatory authority whenever flies are evident. Broken, torn, or poorly fitted screens shall not be accepted as satisfactory compliance.

(2) Outer screen doors open outward and are self-closing. Exclusion of flies can be made more effective when screen doors open outward and are provided with closing devices, such as spring hinge, pulley and weight, coil spring, or similar device.

(3) Other effective means are provided to prevent the entrance of flies and if, at the same time.

(4) No flies are present in the packing room.

4.9 Light.—Ample light to work by shall be provided in all working rooms. When necessary, natural light shall be supplemented with artificial light.

Public Health Reason: Adequate light encourages cleanliness of working rooms and shucking processes.

Satisfactory Compliance: This item shall be deemed to have been satisfied if:

(1) Existing State regulations governing lighting are complied with or in the absence of such regulations light of an intensity of not less than 5 foot-candles is maintained on all working surfaces when workers are at their working positions.

(2) Windows or other openings, if depended upon for illumination, have an aggregate area of not less than one-tenth of the total floor area and are so arranged as to insure proper light distribution.

(3) All windows and skylights are kept clean.

(4) Artificial light is provided wherever shucking and packing are practiced at night or on dark days.

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4.10 Heating and Ventilation.—Working rooms shall be heated when necessary and ventilated so that workers may operate with safety and efficiency and without impairing their health.

Public Health Reason: If sufficient heat is not provided the efficiency of the operators is affected and may result in practices which impair the sanitary quality of the shellfish.

Inadequate ventilation or overcrowding promotes the spread of respiratory infections among employees.

Satisfactory Compliance: This item shall be deemed to have been satisfied if:

(1) A comfortable working temperature is maintained.

(2) Ventilation is provided sufficient to eliminate odors and discomfort.

(3) At least 10 square feet of floor space is provided for each shucker.

4.11 Toilet Facilities.—Every shellfish shucking house shall be provided with separate sanitary toilets for each sex, conveniently located, but not opening directly into any packing or shucking room. Such toilets shall be constructed according to local and State requirements and at least equal to rural sewage disposal recommendations of the Joint Committee on Rural Sanitation (Rural Sewage Disposal—Recommendations of Joint Committee on Rural Sanitation—Reprint No. 2461 from the Public Health Reports, 1943, 32 pages. Can be obtained from the Superintendent of Documents, Washington 25, D. C.). Toilets shall be properly operated and maintained, so that the waste is inaccessible to flies and does not pollute the surface soil or contaminate any water supply. Separate toilet facilities for each sex shall not be required where family shucking is carried on and satisfactory toilet facilities are available for family use in the home or conveniently located nearby.

Public Health Reason: The organisms of typhoid fever, dysentery, and of other diseases are present in the body wastes of persons sick with such diseases. In the case of typhoid fever, well persons (carriers) may discharge the organisms in their body wastes. If a toilet is not flytight and so constructed as to prevent overflow, infection may be carried from the excreta to the shucked shellfish by flies or through the pollution of the water supply used in processing the shellfish or the water in which the shellfish are grown.

Satisfactory Compliance: This item shall be deemed to have been satisfied if:

(1) There are separate flush toilets for each sex, conveniently located in the plant, the wastes from which are disposed of in a manner satisfactory to the State health authorities. (The requirement of separate toilets for each sex does not apply in the case of a family shucking plant located in the immediate vicinity of a home providing satisfactory toilet facilities.)

(2) The toilets do not open directly into the shucking or packing room.

(3) The toilets are constructed, operated, and maintained in accordance with plans and instructions of the local and State authorities.

(4) At least 1 water closet and 1 urinal are provided for every 30 male employees and at least 1 water closet is provided for every 20 female employees.

(5) A pit privy, chemical toilet, or other type of privy is provided, constructed, and operated in accordance with plans and instructions of the State board of health in those States permitting the use of these types of toilets.

(6) There is no evidence of human defecation or urination about the shucking house premises except in the toilets provided for these purposes.

(7) Facilities are maintained in proper operating condition, the toilet room is kept clean, equipped with self-closing doors, has no offensive odors, and if there is an adequate supply of toilet tissue available in the toilets.

4.12 Handwashing Facilities.—An adequate number of lavatories with running hot and cold water shall be provided and preferably so located that their use by plant personnel can be readily checked. A supply of soap and individual towels shall be provided at all times and the facilities shall be maintained in proper operating condition. Signs shall be posted in the toilets and over the lavatory warning the employees to wash their hands thoroughly with hot water and soap and no employee shall return from a toilet to work in the plant without first having washed his or her hands.

Public Health Reason: Washing facilities and sanitary towels are essential to the personal cleanliness of food handlers.

Satisfactory Compliance: This item shall be deemed to have been satisfied if:

(1) There is at least 1 lavatory for every 20 employees.

(2) The handwashing facilities are so located that the person responsible for supervision can readily observe that employees wash their hands before beginning work and after each interruption.

(3) The lavatories are provided with both hot and cold running water.

(4) There is a supply of liquid or powdered soap and proper dispensing facilities, together with individual towels available near the lavatory.

(5) The facilities are maintained in proper operating condition.

(6) Appropriate signs are posted in toilets and over lavatories.

(7) These facilities (and only these facilities) are used by employees when on duty.

4.13 Water Supply.—The plant shall be provided with an abundant supply of water, under pressure, from a source approved by the State health authorities. The supply shall be accessible to all parts of the plant,

adequate in quantity, and of a safe sanitary quality meeting the Public Health Service Drinking Water Standards. No cross or backflow connections with unapproved water supplies or other possible sources of contamination shall be permitted.

Public Health Reason: The water supply should be accessible so as to encourage its use in cleaning operations. It should be adequate so that cleaning, rinsing, and sterilizing of the equipment will be thorough; and it should be of safe, sanitary quality in order to avoid the contamination of the equipment and shellfish.

Satisfactory Compliance: This item shall be deemed to have been satisfied if:

(1) The water supply is easily accessible to all parts of the plant and is adequate for all purposes.

(2) A hot water supply of adequate capacity is provided.

(3) The water supply is approved by the State health authorities.

(4) There is no connection between the safe water supply and water from an unsafe source through which it is possible to contaminate the safe water supply.

(5) At least one inspection is made per year to determine whether the location, construction, and operation of the supply comply with State health department requirements. Bacteriological results on samples of water shall comply with the Public Health Service Drinking Water Standards.

4.14 Personnel.—No person known to be affected with any disease in a communicable form, to be a carrier of such disease, or who has infected wounds or open lesions on the exposed portions of the body shall be employed in a shucking or packing plant. If the owner or manager has reason to suspect that any employee has contracted a communicable disease he shall immediately notify the proper health officials who will take such action as may be indicated. Pending such action by the health officials or the recovery of the employee, said employee shall be excluded from the plant.

Public Health Reason: Persons who are infected with, or are carriers of organisms of typhoid fever, dysentery, septic sore throat, or certain other communicable diseases might transmit such disease to others through shucked shellfish. Persons with infected wounds or open lesions on the exposed portion of their bodies might likewise transmit the infecting organisms to the shucked shellfish and cause so-called food poisoning of the consumers.

Satisfactory Compliance: This item shall be deemed to have been satisfied if:

(1) Persons with infected wounds or open lesions on the exposed portion of their bodies and those who are known to be carriers of or are

infected with typhoid fever, dysentery, or other communicable diseases likely to be transmitted by shucked shellfish are excluded from the plant.

(2) Daily observations of employees are made by owner or manager with reasonable inquiries being made when signs of illness appear.

(3) The inquiry indicates the possibility of a communicable disease, the ill employee is excluded from the plant pending clearance by the health officials or the complete recovery of the employee.

(4) The inquiry leads to the suspicion of a communicable disease a prompt, complete report is made to the proper health officials.

(5) Action is taken by the proper health officials upon receipt of such report.

(6) Employees having diarrhea or sore throat promptly report this fact to the manager.

4.15 Supervision.—The management shall designate an individual to be responsible for the compliance with those sections of this Manual having to do with plant cleanliness, personnel, and operation.

Public Health Reason: The importance of handwashing by food handlers is great and unless someone is made responsible for this process, it is apt to be forgotten or overlooked. Satisfactory cleaning of the shucking room does not follow if the responsibility for the condition of the shucking room is divided among two or more persons. Clean floors, walls, and benches reduce the chances of contamination of the shellfish or shucking utensils during shucking operations. Daily cleaning of all surfaces will prevent mud from becoming dry and caked making it difficut to remove. Periodic disinfection of the plant and the removal of accumulated contamination, will reduce the possibility of contaminating the shellfish passing through the shucking room.

Careful daily observation of the health of employees with proper inquiries when indicated and with exclusion of ill employees will tend to prevent possible contamination of the shucked stock with pathogenic organisms.

Satisfactory Compliance: This item shall be deemed to have been satisfied if:

A single individual has been designated by the management to supervise the activities above enumerated and if there is evidence that he has been carrying on his responsibilities satisfactorily.

Shucking Room Equipment

4.16 Shucking Benches and Stands.—The tops of shucking benches and the sides above the bench top to a height of at least 2 feet shall, when the benches are used to provide storage, be of smooth concrete, metal, or other nonabsorbent material, free from cracks or crevices and

so constructed that drainage is complete and rapid. Shucking blocks shall be removable unless an integral part of the bench and shall be of solid one-piece construction. The stands or stalls shall be of finished material and painted where hand contact occurs. There shall be no boxes, shelves, or nails above the benches where miscellaneous articles might accumulate.

Public Health Reason: Unless shucking benches, stands, blocks, and stalls are made of smooth material which can be cleaned easily, they will become very foul and materially affect the shellfish quality. Storing or hanging articles above shucking benches is undesirable, because of the chance that some article will fall into the shucked shellfish and because their presence interferes with thorough cleansing of the benches and adjacent walls.

Satisfactory Compliance: This item shall be deemed to have been satisfied if:

(1) The shucking benches are of smooth concrete, metal, or other nonabsorbent material free from cracks or crevices which might hold putrescible matter, and are maintained in a clean condition.

(2) The benches drain completely and rapidly.

(3) The shucking blocks are removable, or an integral part of the bench and are of solid, one-piece construction.

(4) The stands or stalls are of finished material and painted where hand contact occurs.

(5) There are no boxes, shelves, wires, or nails above the benches where shuckers' gloves, finger cots, knives, or miscellaneous articles might accumulate.

4.17 Pails.—All shucking pails or colanders shall be made of a not readily corrodible, smooth, impervious material and shall be constructed in such a manner as eliminate grooves, seams, and cracks, where foreign particles, dirt, and slime might collect. All seams and joints shall be well filled with solder and dressed to a smooth surface. If "dip buckets" are used they shall be of the same quality as shucking pails.

Public Health Reason: Shellfish containers and other utensils unless so constructed as to have flush joints and seams, smooth, easily cleaned, and accessible surfaces, and of durable noncorrodible metal are liable to harbor accumulations in which undesirable bacteria will grow.

Satisfactory Compliance: This item shall be deemed to have been satisfied if:

(1) All containers, pails, colanders, and similar equipment are constructed of smooth metal with a not readily corrodible surface, of a shape that will make cleaning easy, and with all joints and seams soldered smooth.

(2) All containers, pails, colanders, and similar equipment are in good repair, free of breaks and corroded places. The use of agateware, rusted or dented pails is not acceptable.

4.18 Knives and Blocks.—Knives shall be made of not readily corrodible, smooth, impervious material, and shall be constructed in such manner as to eliminate grooves, joints, and cracks where food particles and dirt might collect. The handles of opening knives and the breaking blocks shall be so constructed as not to have cracks and crevices which would retain food particles, dirt, and slime.

Public Health Reason: Knives, breaking blocks, and breaking irons containing joints and cracks are not easily cleaned and are apt to harbor accumulation of slime and other material in which undesirable bacterial growth can occur.

Satisfactory Compliance: This item shall be deemed to have been satisfied if:

All opening knives, breaking blocks, and breaking irons are constructed and maintained in such manner that there are no open joints, seams, or cracks in which material may accumulate.

4.19 Aprons and Finger Cots.—All persons who handle shucked shellfish shall wear a clean apron or coat of washable or waterproof material which shall be kept reasonably clean. If finger cots are worn they shall be of clean washable or waterproof material. Similar shields for protecting the palm of the hand shall be of clean washable or waterproof material, preferably rubber.

Public Health Reason: Because the hands of all employees frequently come in contact with their clothing, it is important that the clothes worn during the handling of shucked shellfish be clean. The nature of their work makes it necessary that they wear some outer garment to cover the front of the clothing. This garment must be washable or waterproof. Finger cots unless kept clean become saturated with dirt which in turn contaminates the shucked shellfish.

Satisfactory Compliance: This item shall be deemed to have been satisfied if:

(1) Washable or waterproof aprons or coats are worn by all persons engaged in handling shucked shellfish.

(2) Aprons and coats are kept reasonably clean and are stored in a place provided for the purpose.

(3) Finger cots, if worn, are of clean, washable, or waterproof material.

Operation

4.20 Cleaning.—All utensils used in shucking, such as pails, knives, hammers, shucking blocks, and breaking irons, which come in contact

with shucked shellfish, shall be thoroughly scoured until clean immediately following each day's operations. Shucking pails shall be rinsed with running water before each filling. The practice of returning shucked shellfish to the shucker after delivery to the packing room should not be permitted. Floors, walls, and benches shall be washed free from accumulations of mud, shells, and shell chips with water within 2 hours after shucking operations for the day have ceased.

Public Health Reason: Shucked shellfish cannot be kept clean if allowed to come in contact with unclean containers or utensils or if containers or utensils are allowed to come in contact with dirty surfaces.

Satisfactory Compliance: This item shall be deemed to have been satisfied if:

(1) All utensils and equipment such as pails, knives, hammers, shucking blocks, and breaking irons are thoroughly scoured until clean, using warm water and soap or an alkali cleanser.

(2) Cleansing is performed within two hours after the day's operation has ceased.

(3) The plant supervisor is held responsible for the satisfactory cleaning of this equipment.

(4) Shucking pails are rinsed with tap running water before each filling.

(5) "Dip buckets," if used, shall be rinsed and the water renewed each time the shucker delivers shucked shellfish to the packing room.

(6) Floors, walls, and benches are washed free from accumulation of mud, shells, shell chips, and so forth with water from an approved source within 2 hours after shucking operations for the day have ceased.

(7) After having been thoroughly cleaned, benches, blocks, and stalls are flushed at least once each week with hypochlorite solution containing 50 p.p.m. or more of available chlorine or other disinfecting agent approved by the State regulatory authority.

4.21 Bactericidal Treatment.—All utensils used in shucking, such as pails, knives, hammers, breaking irons, "dip buckets," etc., which come in contact with shucked shellfish shall be subjected to bactericidal treatment after thorough cleansing within 3 hours of the termination of each day's operations and be stored in a place where they are protected from contamination until used. Equipment so treated shall be protected from recontamination in storage.

Public Health Reason: Regular periodic sterilization of all equipment will remove any chance contamination which may have reached the equipment since it was last sterilized. The importance of destroying any disease-producing organisms which may have reached the equipment is obvious, since such organisms may in turn contaminate the shellfish. The possibility that the organisms may increase in number in the shucked shellfish increases the danger.

Satisfactory Compliance: This item shall be deemed to have been satisfied if all the utensils and equipment such as pails, knives, hammers, and breaking irons have been:

(1) Exposed in a steam cabinet for at least 15 minutes to a temperature of at least 170° F., or for at least 5 minutes to a temperature of at least 200° F., said cabinet being equipped with an accurate indicating thermometer located in the coldest zone; or

(2) Immersed in hot water at a temperature of 170° F. or more for at least 2 minutes; or

(3) Exposed to hot air at a temperature of at least 180° F. for at least 20 minutes in a properly designed oven or hot-air cabinet equipped with an accurate indicating thermometer located in the coldest zone; or

(4) Immersed in or exposed to a flow of chlorine solution prepared fresh each day for a period of at least 2 minutes. The initial strength of the solution shall be such that after final use it will contain not less than 50 p.p.m. chlorine.

AMOUNTS OF CHLORINE COMPOUNDS REQUIRED TO GIVE APPROXIMATELY 100 P.P.M. CHLORINE BY READILY AVAILABLE MEASURING DEVICES

Volume of water—gallons	Dry chlorine compounds available chlorine			Liquid hypochlorite solutions available chlorine	
	15 percent	25 percent	70 percent	1 percent	5 percent
20	5½ tbs.	3½ tbs.	1½ tbs.	3 cups	10 tbs.
40	11 tbs.	6½ tbs.	2½ tbs.	3 pints	1¼ cups
60	1 cup	10 tbs.	3½ tbs.	4¾ pints	2 cups
80	1⅜ cups	13½ tbs.	4½ tbs.	6½ pints	2½ cups
100	1⅝ cups	1 cup	6 tbs.	4 quarts	3 cups
150	2¾ cups	1½ cups	9 tbs.	6 quarts	4¾ cups
200	3⅜ cups	2 cups	12 tbs.	2 gallons	3 pints

Note:

Dry Measure	*Liquid Measure*
1 tablespoon (tbs.)—approx. 0.3 oz.	1 tbs. or 3 tsp.—approx. 15 ml.
1 cup (½ pint)—approx. 5 oz.	1 cup or ½ pint—approx. 16 tbs.

4.22 Other Bactericides.—The inspector should not approve the use of any other form of bactericide until he has satisfied himself by his own or other official tests that it is satisfactory for use in connection with shellfish sanitation, and that it is of adequate strength. The local inspector should consult his State board of health regarding all bactericides in use in his territory, so that he may be certain he is using the proper test.

Under no circumstances shall formaldehyde or other preservative be used where such preservatives will come into contact with shellfish meats.

4.23 Cabinets with Auxiliary Steam Boilers.—In medium and large shucking plants a steam cabinet with auxiliary steam boiler is the most satisfactory type of equipment for bactericidal treatment of utensils and equipment. (Detailed directions for the construction and operation of a steam cabinet may be obtained from the State regulatory authority. Directions for the construction of such a cabinet are given on pages 66 and 67 of Public Health Bulletin No. 220 (1939 edition), Milk Ordinance and Code, obtainable from the Superintendent of Documents, Washington 25, D. C.).

4.24 Hot Water Sterilization.—Use of hot water for bactericidal treatment shall not be accepted as satisfactory compliance unless the articles are completely immersed for at least 2 minutes in water maintained at 170° F. or higher throughout the period of total immersion. Pouring hot, or so-called boiling water, from vessel to vessel is not adequate and shall not be accepted.

Sterilization with hot water can be accomplished in a vat. The vat should have sufficient depth to allow the complete immersion of at least one shucking bucket.

An accurate indicating thermometer should be available in every plant so that the water temperature can be noted during the sterilization process.

4.25 Storage of equipment.—All equipment used in the shucking process, including shucking pails, "dip buckets," knives, breaking blocks, finger cots, etc., shall be left in steam cabinet or stored in other suitable place in the plant after cleansing and bactericidal treatment.

Public Health Reason: Unless equipment that has been subjected to cleansing and bactericidal treatment is protected from contamination until it is used, it may easily become contaminated and in turn contaminate the shucked shellfish. Equipment taken home by shuckers may easily be exposed to material which might cause illness, especially in homes where cases of infectious diseases may be found.

Satisfactory Compliance: This item shall be deemed to have been satisfied if:

All equipment used in the shucking room is stored in a suitable box or locker protected from careless handling and from dust, splashing, dirt, and other contamination.

4.26 Shell Disposal.—Shells from which meats have been removed shall be promptly removed from the shucking room and disposed of so that the shucked product can in no way become contaminated.

Public Health Reason: When shells are allowed to accumulate in the shucking room, conditions are created which make it difficult to keep the

room in a neat and clean condition. Under such conditions the shucked product is more apt to become contaminated than if the shucking room is kept clean, neat, and orderly.

Satisfactory Compliance: This item shall be deemed to have been satisfied if the shells are removed from the shucking room with sufficient promptness to prevent interference with the sanitary operation of the plant. Among the methods approved for the removal of shells are the following:

(1) Disposition through a hole in the shucking bench leading to the area beneath the bench which is closed off from the shucking room and open to the outside of the house.

(2) Depositing the shells on moving conveyor belts which continuously remove the shells from the shucking room.

(3) Depositing the shells in baskets, barrels, or wheelbarrows provided beside each shucker, such baskets, barrels, or wheelbarrows to be promptly removed when full.

4.27 Miscellaneous.—Miscellaneous equipment not necessary to carry out the shucking processes shall be excluded from the shucking room. All unused or abandoned equipment or material foreign to this particular business shall be removed from the operating part of the plant. All domestic animals and rodents shall be excluded from all parts of the plant. The shucking and packing portions of the plant, when in operation, shall be restricted to the handling of shellfish to prevent accumulation of material and articles which would hinder cleaning or might contribute to the contamination of the shellfish.

Public Health Reason: The presence of miscellaneous and extraneous equipment and material in the shucking room interferes with the proper cleansing of the room and equipment, and its presence may result in contaminating the food product handled in the shucking room. The habits and characteristics of the dog, cat, rat, or other domestic animals, or rodents are such that their presence near shell stock or shucked stock increases the possibility of it becoming contaminated.

Satisfactory Compliance: This item shall be deemed to have been satisfied if:

(1) All equipment and material not actually employed in the shucking process are excluded from the shucking room.

(2) The shucking and packing portions of the plant are not used simultaneously for the handling of shellfish and the carrying on of other operations.

(3) There is no accumulation of miscellaneous articles in the plant not stored in their proper place.

(4) There is no evidence of the presence of domestic animals and rodents.

(5) No shellfish containers or equipment are stored, handled, or used beneath overhead sewer, water, or drain lines unless such pipes are provided with suitable means of carrying off possible leakage or condensation.

Packing and Shipping Room Equipment:

4.28 Utensils (skimmers, blowers, and so forth).—All packing equipment such as skimmers, tanks, tubs, measures, colanders, paddles, and so forth shall be made of not readily corrodible, smooth, impervious material and constructed in such a manner as to eliminate grooves, seams, and cracks where foreign material and slime might collect. All seams and joints shall be well filled with solder and dressed to a smooth finish. A stand or shelf shall be provided under all chutes from skimmers or blowers, to support a measure or can. The surfaces of skimmers, blowers, tubs, tanks, and other utensils with which shucked shellfish come in contact shall be free of paint and rust. The air pipes in the blower shall be removable or so located that cleaning is not difficult. The portion of the air pipes below the tank liquid level shall be of smooth, not readily corrodible, impervious material. There shall be a sterilization connection of adequate size to the air line of the blower above the tank liquid level by which steam or hot water may be forced through the line.

Perforations in the skimmers, colanders, and blower trays shall be smooth to facilitate cleaning. Skimmers, ladles, and colanders of wire mesh construction are not permitted. Several types of blowers have narrow and deep compartments along their sides or at corners, separated from the main part of the blower by a perforated plate. The area thus formed is very difficult, if not impossible, to clean and offers an ideal place for dirt and slime to collect. Where this occurs the plates should be removed or the space tightly sealed from the main part of the tank.

Pipes should be supported at a sufficient distance above the bottom of the tank to allow easy passage of a brush between the pipes and tank bottom.

Air pump intakes should be protected against contamination.

Shallow tanks and tubs should be elevated by legs, by a table, or by a bench to raise the top rim at least 3 feet above the floor.

Tables and shelves shall be made of materials that can be cleaned readily.

The washing of shellfish by "blowing" is not always necessary and in many instances produces an inferior product. Where "blowing" is practiced, attention is directed to the requirements of the United States Food and Drug Administration promulgated to prevent adulteration of shucked stock.

Public Health Reason: Containers and utensils which have joints and seams, inaccessible surfaces, and are constructed of nondurable or non-

corrodible metal, are apt to harbor accumulations in which undesirable bacterial growth is produced. Paint on surfaces may peel on being exposed to continuous wear and the peeled paint may enter the packing can with the shellfish. The slime and foreign material which accumulates in air pipes and blowers below the tank liquid level affords an excellent breeding place for bacteria at each blowing. Such material may be dislodged and forced into the batch of shucked shellfish then in the blower, thus seeding the shellfish with organisms which may cause their spoilage or produce illness in consumers.

Tables and shelves unless made of materials that can be cleaned readily will not be cleaned properly and may harbor accumulations in which undesirable bacterial growth is produced.

Satisfactory Compliance: This item shall be deemed to have been satisfied if:

(1) All multiuse containers, utensils, and other equipment are constructed of smooth metal with a not readily corrodible surface, of a shape that will make cleaning easy, and with all joints and seams soldered smooth.

(2) All multiuse containers, utensils, and other equipment are in good repair, free of breaks, and corroded places.

(3) A stand or shelf located about 2 feet above the floor is provided under all chutes from skimmers and blowers.

(4) The surfaces of equipment coming in contact with shucked shellfish are free of paint and rust.

(5) Air pipes in blowers can be removed readily.

(6) The entire blower line below the liquid level can be easily cleaned.

(7) There is a connection to, or a removable section in, the blower line, above the liquid level of the tank, where steam or hot water can be introduced.

(8) Tables and shelves are made of materials which can be cleaned readily.

(9) Air pump intakes are so located as to be protected against contamination.

4.29 Shipping Containers.—Shucked shellfish shall be packed and shipped either in single-service containers made of clean, impervious materials positively sealed or in such containers so sealed that tampering with the container can be detected.

The packer's certificate number preceded by the State abbreviation shall be impressed, embossed, lithographed, or otherwise permanently recorded on the container or on the cover if the cover becomes an integral part of the container during the sealing process.

Public Health Reason: Unless shucked shellfish are packed in clean containers and sealed so that they cannot be tampered with while en route

to the final point of destination, all precautions taken to produce a clean and safe product prior to packing may be wasted. The opening of containers of shucked shellfish by intermediate handlers may subject this food product to needless and possible filthy handling, destroying the benefit of careful and judicious processing. The approximate number of shucked shellfish in any container can be stated on a label or elsewhere so that inspection for this purpose will not be necessary. Labeling the container is necessary to facilitate tracing the product to its source.

Satisfactory Compliance: This item shall be deemed to have been satisfied if:

(1) Shipping containers are of metal, waxed paper, glass, or other material of such design that after sealing, opening the container, or tampering with the seal will be evident.

(2) All shipping containers are clean when packed.

(3) All shipping containers are stored in a clean place.

(4) Packer's certificate number is impressed, embossed, or otherwise permanently recorded on the container or an integral part thereof.

(5) Returnable containers are made of noncorrodible, smooth, durable material; with straight walls and tight-fitting covers; and with all seams and joints flush and dressed to a smooth surface.

4.30 Refrigeration Facilities.—Refrigeration facilities shall be provided capable of cooling shucked shellfish to a temperature of 50° F. or less within 2 hours after the shellfish are shucked and keeping them at or below 50° until delivered to the consumer. If shucked shellfish are frozen they shall be kept in a frozen condition until delivered to the consumer. Where a refrigerator or ice box is used, it shall have adequate capacity to store all shucked stock received by or packed in the plant during the day. The refrigerator or ice box should be well insulated and have an impervious lining; the floor should be graded to drain quickly; and an accurate thermometer shall be kept in the refrigerator at a point predetermined to have approximately the highest temperature.

Public Health Reason: Shucked shellfish are an excellent medium for the growth of bacteria at temperatures above 50° F., and it is essential that the temperature of shucked shellfish be kept below 50° F. in order to keep bacterial multiplication to a minimum. The likelihood of contracting disease is much increased when shellfish contain excessive numbers of harmful bacteria and for this reason it is extremely important that they be quickly cooled so that any small numbers of bacteria which may have entered shall not be permitted to multiply. High temperature may also be responsible for physical deterioration and spoilage of shucked stock. Alternate freezing and thawing of shellfish hastens deterioration and spoilage which may cause illness in the consumer.

Satisfactory Compliance: This item shall be deemed to have been satisfied if:

(1) Shucked shellfish can be cooled to a temperature of 50° F. or less within 2 hours after being shucked, but are not frozen, and crushed ice in a clean, well-drained bin, chest, or ice box or a refrigerator free from excessive odors is provided for storage; or if

(2) The shucked shellfish are packed in packages in which they will reach the consumer unopened, and facilities are provided whereby shucked shellfish may be quickly frozen and stored at below freezing temperatures until delivered to the consumer.

4.31 Ice.—Ice used in cooling water for processing of shucked stock or for cooling shucked stock during processing shall be obtained from an approved source and shall be stored and handled in a cleanly manner. No ice shall be allowed to come in contact with shucked stock after processing has been completed.

Public Health Reason: There is the possibility of ice becoming contaminated during the manufacturing process and in the storing and handling subsequent to manufacture.

Satisfactory Compliance: This item shall be deemed to have been satisfied if:

(1) Ice is manufactured from water meeting the bacteriological requirements of the Public Health Service Drinking Water Standards or is approved by the State regulatory authority.

(2) Ice is stored in such manner that it will not come in contact with floor or other drainage.

(3) Ice is thoroughly washed before being placed in blowers, tanks, tubs, buckets, or cans, in which shucked shellfish are subsequently placed.

(4) All materials employed in handling and preparing the ice for use are used for no other purpose and are kept clean.

4.32 Bactericidal Treatment Facilities.—Facilities for bactericidal treatment of packing equipment such as skimmers, tanks, tubs, measures, colanders, and paddles, which come in contact with shucked shellfish, shall be provided.

Public Health Reason: Mere cleaning of utensils and equipment does not insure that all disease-causing organisms which may have been present will have been removed or destroyed. Even very small numbers thus remaining may grow to dangerous proportions if transferred to shucked shellfish.

Satisfactory Compliance: This item shall be deemed to have been satisfied if:

Facilities are provided for adequate bactericidal treatment of skimmers, tanks, tubs, measures, colanders, and paddles. Such treatment will be

considered to be adequate if the articles above enumerated have been exposed to one or more of the bactericidal treatments described in 4.21, p. 26.

4.33 Clothing and Aprons.—Persons working in the packing room shall wear clean outer garments protected with clean waterproof or washable aprons or coats. When manual handling of shucked shellfish which have received their final washing becomes necessary, clean rubber gloves shall be worn, or the hands shall be washed immediately before such manual handling.

Public Health Reason: Because the hands of all employees frequently come in contact with their clothing it is important that the clothes worn during the handling of shucked shellfish be clean. The nature of the employees' work makes it necessary that they wear some outer garment to cover the front of the clothing. This garment must be washable or waterproof.

Satisfactory Compliance: This item shall be deemed to have been satisfied if:

(1) Washable or waterproof aprons or coats are worn by all persons engaged in handling shucked shellfish.

(2) Aprons are kept scrupulously clean.

(3) All aprons and clothes not in use are stored in a cloakroom or locker room provided for this purpose.

(4) Rubber gloves, if used, are bactericidally treated and then stored with the utensils so treated.

Operation:

4.34 Cleaning (Utensils and Building).—The floors, walls, and if necessary the ceiling of the packing room shall be cleaned at the end of each day's operations and flushed with water meeting the Public Health Service Drinking Water Standards. Windows and skylights should be kept clean. Refrigerators or ice boxes shall be washed out once a week or more often if necessary. All packing equipment, such as skimmers, tanks, tubs, measures, colanders, and paddles, which come in contact with shucked shellfish, shall be thoroughly scoured until clean at the end of each day's operations. Air pipes in blowers shall be removed daily at the end of packing operations and their interior and exterior surfaces be thoroughly cleaned.

Public Health Reason: Clean floors, walls, and ceiling reduce the chances of contamination of shucked shellfish during the time they are being washed and packed. Periodic cleaning of the refrigerators or ice boxes is necessary to remove dirt or foreign material from the walls and floor which might be carried into the room by foot traffic and by ice, and to reduce odors which might result in a confined space. Shucked shell-

fish cannot be kept clean if allowed to come in contact with unclean containers or utensils.

Satisfactory Compliance: This item shall be deemed to have been satisfied if:

(1) The floors, walls, and ceiling of the packing room are free from accumulations of dirt and other wastes except those which have accumulated since the beginning of the day's operation, provided such accumulation is removed within 2 hours after packing operations have ceased.

(2) All dirty surfaces have been flushed with water meeting the Public Health Service Drinking Water Standards, after accumulations have been removed.

(3) Windows and skylights are clean.

(4) The refrigerator or ice box is clean and free from excessive odors.

(5) All utensils and equipment such as skimmers, tanks, tubs, measures, colanders, and paddles are thoroughly scoured until clean, using warm water and soap or an alkali cleanser.

(6) Cleaning is performed within 2 hours after the day's operations have ceased.

(7) Air pipes in blowers are removed daily at the end of packing operations and their interior and exterior surfaces are thoroughly cleaned.

4.35 Bactericidal Treatment.—All packing room equipment such as skimmers, tanks, tubs, measures, colanders, and paddles, which come in contact with shucked shellfish, shall be sterilized after cleansing.

Cleansing and sterilization operations shall be carried on within 3 hours of the terminating of each day's operations and equipment be stored until used in a place where it will be protected from contamination. Large equipment which cannot be stored in a protected place shall be cleaned at the end of each day's operations and be subjected to bactericidal treatment immediately before use.

Public Health Reason: Since mere cleaning of utensils and equipment with which shucked shellfish come in contact does not insure that all disease organisms which may be present will be removed or destroyed, it becomes necessary to apply bactericidal treatment to such equipment. Even very small numbers of organisms may be sufficient to seed packed shellfish and grow to dangerous proportions before such shellfish are consumed.

Satisfactory Compliance: This item shall be deemed to have been satisfied if:

The articles above enumerated have been subjected to one or more of the bactericidal treatments described in Sec. 4.21, p. 26, in accordance with the satisfactory compliance requirements stated therein.

4.36 Equipment Storage.—All equipment with which shucked shellfish

in the packing room come in contact shall, after thorough bactericidal treatment, be stored in such manner as will protect it from contamination before it is again put to use.

Public Health Reason: All of the precautions taken in sterilizing equipment may be undone by improper storing of the equipment following treatment.

Satisfactory Compliance: This item shall be deemed to have been satisfied if:

(1) The equipment is stored in a cabinet where it will be protected from dust, drippings, splashings, flies, rodents, domestic animals, or unauthorized handling. The utensils may remain in the steam chest in which sterilization has taken place or in the hot water vat or tank in which bactericidal treatment has been applied if they are fully protected from contamination prior to use, or may be

(2) Stored in the packing room on clean shelves, stands, tables, or wires if the packing room is locked so as to exclude all unauthorized persons.

4.37 Packing Shucked Stock.—Shucked shellfish shall be packed in containers dated and sealed (Sec. 4.29, p. 31). If the shucked shellfish have not been subjected to a quick-freeze process they shall be cooled to a temperature between 32° F. and 50° F. within 2 hours after shucking and be kept at that temperature. After tub washing or blowing, the washed shellfish shall not be exposed to contamination.

Public Health Reason: Unless shucked shellfish are packed in containers which are sealed after packing, they may be opened by unauthorized persons and become contaminated. Proper identification and dating of the container is necessary to facilitate tracing the product to its source. Unless shucked shellfish are kept at low temperatures until they are consumed undesirable bacterial growths may result in their spoilage and thus cause illness.

Satisfactory Compliance: This item shall be deemed to have been satisfied if:

(1) Date of shucking is impressed, embossed, or otherwise permanently recorded on the container or an integral part thereof.

(2) Shucked shellfish, not subjected to quick-freezing process, are cooled to a temperature between 32° F. and 50° F. within 2 hours after shucking, and sealed in containers and are stored and shipped in such manner as will hold their temperature between 32° F. and 50° F. If subjected to quick-freezing process the temperature of the shucked shellfish shall be held at 10° F. or lower.

(3) Washed shellfish are not exposed to contamination before being packed.

4.38 Repacking Shucked Stock.—The packing of shucked shellfish preferably should take place only in the same plant as the one in which they are shucked. If repacking is practiced, it shall be done strictly in accordance with all the requirements stipulated for packing plants. The stock to be repacked must be received at the repacking plant in approved shipping containers. Containers shall be coded to show the earliest date of shucking of stock packed therein, as well as the plant or plants in which the stock was shucked. This information shall be made a part of the plant record.

Public Health Reason: The repacking of shucked shellfish in plants other than those in which they have been shucked exposes the shucked shellfish to additional and unnecessary handling, subjects them to further possibilities of contamination, and brings about greater deterioration due to lengthening the time interval between the shucker and the consumer. Combining in one pack shucked shellfish from more than one source permits the possibility of contamination of the entire pack should the shellfish from any one of the sources be contaminated. Where repacking is practiced tracing of shellfish to its source is difficult.

Satisfactory Compliance: This item shall be deemed to have been satisfied if:

(1) Repacking is practiced strictly in accordance with all the requirements stipulated for packing plants.

(2) The stock to be repacked is received at the repacking plant in approved shipping containers at proper temperatures.

(3) Containers are marked with the name of the shucking plant, its certificate number, and coded to show the earliest date of shucking of the stock packed therein.

4.39 Packing and Shipping Shell Stock.—The washing of shell stock, when necessary, should be done either with water obtained from sources approved by the State regulatory authority or from approved shellfish areas. All shell stock, except that consigned to a shucking plant, shall be packed and shipped in clean containers such as barrels, bags, crates, or boxes under conditions which will prevent spoilage or contamination. When consigned to shucking plants in bulk, shell stock may be packed and shipped in such vehicles as clean railroad cars, trucks, and boats, under conditions which will prevent spoilage or contamination. Storage facilities should be at least equal to those described in Sec. 4.4, p. 17. A dealer holding a certificate for shell stock only, or as a reshipper, shall not shuck any shellfish.

Public Health Reason: If shell stock are washed in polluted water, the shellfish may become contaminated. If spoilage or contamination is not prevented, illness and possible death may result from the consumption of

such shellfish. The establishment of a dealer holding a certificate for shell stock only or as a reshipper is not required to meet the provisions set forth in this manual for shucking plants; if shellfish are shucked in this type of establishment, the shucked stock is more likely to become contaminated and cause disease because adequate facilities and equipment are not available to permit shucking in a clean manner.

Satisfactory Compliance: This item shall be deemed to have been satisfied if:

(1) Water for washing shell stock is obtained from shore sources approved by the State regulatory authority or from approved shellfish areas.

(2) Shipping containers such as boxes, barrels, crates, and bags, and vehicles used in transportation such as railroad cars, trucks, and boats are clean.

(3) Trucks and other conveyances are covered and the shellfish therein maintained at temperatures which will keep them alive yet prevent them from freezing.

(4) Shellfish are not shucked by a dealer holding a certificate for shell stock only or as a reshipper of shell or shucked stock.

(5) Dry storage facilities are at least equal to those described in Sec. 4.4, p. 17.

4.40 Identification of Shell Stock on the Market.—Shell stock shall be identified by a tag or label securely fastened to the shipping container and bearing the certificate number of the shipper, his name and address, the name and address of the consignee, and the kind and quantity of shell stock in the container.

Public Health Reason: The prompt discovery and elimination of contaminated shellfish is necessary to protect the health of shellfish consumers.

Satisfactory Compliance: This item shall be deemed to have been satisfied if:

(1) Tags are securely fastened to all containers in which shell stock is shipped.

(2) Tags are made of substantial stock, reasonably waterproof, and at least 2⅝" x 5¼" in size.

(3) The information on tags includes the name, address, and certificate number of the shipper, the name and address of the consignee, and the kind and quantity of shell stock in the container and, either coded or uncoded, the date the shellfish were taken from the water.

4.41 Records.—To permit tracing readily to the point of origin any shellfish on the market, it is necessary that complete and accurate records be kept by every shellfish dealer.

Public Health Reason: In case of an epidemic of disease attributable to shellfish, it is necessary that health departments be able to determine

the source of contamination and thereby prevent any further epidemic from this source. This can be done most effectively by following the course of a shipment of shellfish through all the various dealers who handle it, back to the point of origin by records kept by every shellfish dealer.

Satisfactory Compliance: This item shall be deemed to have been satisfied if:

(1) Shell stock dealers' records include the date, persons from whom purchased, quantity and kind of shellfish, and the dealers to whom sold.

(2) Reshippers record the dates and names of dealers from whom purchases are made and those to whom sales are made, together with kind and quantity of shellfish involved.

(3) Shuckers record the dates and dealers from whom purchases are made or areas from which shellfish are taken and names of persons to whom sold.

(In most cases, the record of the financial transactions of the plant constitutes a sufficient record as defined in this section.)

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